BTEC Assignment Brief

Qualification	Pearson International BTEC Level 3 National Diploma in Construction and the Built Environment Pearson International BTEC Level 3 National Diploma in Civil Engineering Pearson International BTEC Level 3 National Extended Diploma in Construction and the Built Environment Pearson International BTEC Level 3 National Extended Diploma in Civil Engineering
Unit number and title	**Unit 13: Site Engineering for Construction**
Learning aim(s) (For NQF only)	**B:** Undertake the setting out of infrastructure works **C:** Explore how to maintain horizontal and vertical control in setting out
Assignment title	
Assessor	
Issue date	
Hand in deadline	

Vocational Scenario or Context	You are employed as a trainee site engineer with a medium sized construction company. Your company is involved in a range of setting out activities that requires different surveying setting out methods, techniques and tools and equipment to be used. Each method of setting out requires specific equipment and procedures to be followed. Your Supervisor has asked you to carry out a range of fieldwork setting out activities, which will involve different methods and techniques used to ensure accuracy with respect to linear, levelling and angular measurement setting out techniques. Your manager would like you to research the methods and equipment to set out: • a drainage run • profiles for a cutting or an embankment • a large radius curve In addition, your Supervisor has requested that you explore how to maintain horizontal and vertical control in setting out.

Task 1	**Task 1:** **From setting out information provided by your tutor:** You are required to examine the methods used, and setting out data procedures, to complete the setting out of:

	• profiles for a drainage run • profiles for a cutting or an embankment • a large radius curve-including the calculation of deflection angles and lengths from data provided by your tutor. From data provided by your tutor/assessor you are then required to perform the practical setting out of: • a drainage run-this should include the establishment of profiles to control the works for line and level. • a cutting or embankment- this should include the establishment of profiles to control the works. • a large radius curve- this should include calculations of deflection angles and all setting out information. An example calculation of a large radius curve to be set out is stated below but this may be replaced by a similar standard of curve. Example: Calculate the setting out data for a circular curve of radius 400m connecting two straight sections of road with a deflection angle of 20^0. The chainage of the intersection point is 1500m and centre-line pegs are to be located at 20m chainages. You should record your data on suitable documents and carry out the necessary calculations and checks as required. Reflect on the equipment and accuracy of each method used for the different aspects of surveying fieldwork. **Task 2:** **A suitable site will need to be selected by your tutor from which a grid of levels may be undertaken.** You are required to establish a setting out grid from which a grid of reduced levels should be established and reduced. The grid size should be a minimum of 50 m x 50 m. From the plotted grid of levels your tutor/assessor should provide you with a plan of excavation levels and using the grid of levels produced determine the volume of excavation required for the site. Discuss the different mathematical methods which could be adopted to calculate volume excavations. you are then required to explain the procedure for the setting out structures for vertical and horizontal alignment, this should include concrete and structural steel frame buildings.
Checklist of evidence required	Evidence will be in the form of a report that must include: - A written analysis of the setting out processes as applied to the practical tasks undertaken. - Relevant calculations/data to support the practical setting out tasks.

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	- Records of fieldwork reduced level levels - A plan detail plot of the reduced levels undertaken - Calculation of volume calculations - Consideration of how the fieldwork data can be used to produce construction drawings - A written evaluation the procedure to set out of vertical structures for vertical and horizontal alignment, this should be for both a concrete and structural steel frame form. Your report should include evidence of individual fieldwork. Tutor/assessor observation records will be required to support any evidence of practical and skills based activities recorded. Drawing/details can be produced using manual or Computer Aided Design (CAD) drawing techniques.

Criteria covered by this task:	
Unit/Criteria reference	To achieve the criteria you must show that you are able to:
11/C.D3	Evaluate the methods used to achieve accurate setting out and excavated volume calculation.
11/B.D2	Evaluate the setting-out methodologies used to accurately set out infrastructure works.
11/C.M3	Discuss the methods used to achieve accurate setting out and excavated volume calculation.
11/B.M2	Analyse the setting-out methodologies used to accurately set out infrastructure works.
11/C.P8	Explain how accuracy is achieved in setting out vertical and horizontal elements.
11/C.P7	Calculate the volumes of excavation using an appropriate method.
11/C.P6	Produce a pre-excavation survey grid in a drawn format and calculate volumes.
11/B.P5	Perform setting out a complex road curve using appropriate methods.
11/B.P4	Perform setting out the position of an embankment, cutting and profiles.
11/B.P3	Perform setting out a drainage run to given tolerances.

Sources of information to support you with this Assignment	**Textbooks** Irvine, W. &Maclennan F 2006. Surveying for Construction (5th edition) McGraw Hill, Uren J & Price WF 2010 Surveying for Engineers (5th Edition) Palgrave Macmillan Bannister, Raymond & Baker 1998. Surveying (7th edition). Longman, **Further useful resources may be found at www.edexcel.com/resources/Pages/default.aspx.**
Other assessment materials attached to	*N/A*

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